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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,448	09/11/2003	James R. Eaton JR.	100111542-1	7811
22879 7590 06/12/2007 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER PHAN, TRONG Q	
			ART UNIT 2827	PAPER NUMBER
			MAIL DATE 06/12/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/661,448

Applicant(s)

EATON ET AL.

Examiner

TRONG PHAN

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1 and 3-4 are objected to because of the following informalities:

Claim 1, no antecedent basis for "the number" (line 11) and "the inclusion" (line 12); it is not clear how the number of bit and word lines possible in the grid is increased by the inclusion of the plurality of diodes (lines 11-13).

Claim 3, no antecedent basis for "the operating margin" (line 11) and "the inclusion" (line 12).

Claim 4, no antecedent basis for "the number" (line 7).

Appropriate correction is required.

Specification

2. The disclosure is objected to because of the following informalities:

The feature recited in claim 2 is not described in the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheuerlein, 6,130,835, in view of Sharma et al., 6,885,573.

Scheuerlein, 6,130,835, discloses in Fig. 6A a magnetic random access memory (MRAM) device, comprising:

Regarding claim 1:

an array of magnetic memory cells (9) that store data as different values of impedance;
a grid of bit (4, 5, 6) and word lines (1, 2, 3) for selectively accessing data in the array of magnetic memory cells; and

a plurality of diodes (7 in Fig. 6B) (see lines 34-40, column 6), each connected in series with a respective ones of said magnetic memory cells and between corresponding ones of the grid of bit (4, 5, 6) and word lines (1, 2, 3);

wherein, the number of bit and word lines possible in the grid is increased by the inclusion of the plurality of diodes that reduce leakage currents circulating through non-selected ones of the magnetic memory cells (a diode can be included in each memory cell for preventing sneak path conduction current) (see lines 50-56, column 1);

Regarding claim 2:

a distribution of data-write currents in the grid associated with different ones of said magnetic memory cells across the array varies less than 15% in operation (during a write operation, currents through the different memory cells are minimized) (see lines 46-51, column 10);

Regarding claim 4:

A method for making MRAM devices, comprising:

electrically isolating each and every memory cell (9) in an MRAM array during operation until selected, wherein, a more uniform distribution of read and data-write data access

currents on selected bit and word lines (biasing potentials being between about 200mV and 500 mV during both read operation and write operation) (see lines 42-67, column 3 and lines 1-13, column 4) results to all said memory cells; and increasing the number of rows and columns to support a larger data array (Very Large Scale Integrated Circuit VLSI) (see line 13, column 3).

Scheuerlein, 6,130,835, discloses everything except the leakage current.

Sharma et al., 6,885,573, clearly define that in MRAM device the “sneak path” current is also known as a leakage current (see lines 52-59, column 1).

In view of the above teaching of Sharma et al., 6,885,573, the number of bit and word lines possible in the grid is increased by the inclusion of the plurality of diodes that reduce leakage currents circulating through non-selected ones of the magnetic memory cells (a diode can be included in each memory cell for preventing sneak path conduction current) (see lines 50-56, column 1) would have been obvious also for preventing leakage currents.

5. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheuerlein, 6,130,835, which is modified by Sharma et al., 6,885,573, as applied to claims 1-2 and 4 above, and further in view of Lammers et al., 6,930,915.

Scheuerlein, 6,130,835, which is modified by Sharma et al., 6,885,573, disclose everything except the operating margin.

Lammers et al., 6,930,915, discloses that in MRAM device the decreasing leakage current will increase the write margin (see the abstract and lines 13-22, column 4).

In view of the above teaching of Lammers et al., 6,930,915, the inclusion of the plurality of diodes (7) that reduce sneak path conduction current/leakage currents circulating through non-selected ones of the magnetic memory cells (9) in Figs. 6A-B of Scheuerlein, 6,130,835, which is modified by Sharma et al., 6,885,573, the operating margins for memory cells (9) would have been obvious increased.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tran, 6,826,079, Perner, 6,636,436, Raberg et al., 6,567,300, Hosotani, 7,046,545, Leuschner, 6,704,220, Weitz, 6,897,101, and Ooishi, 6,873,561.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TRONG PHAN whose telephone number is (571) 272-1794. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, AMIR ZARABIAN can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Trong Phan

**TRONG PHAN
PRIMARY EXAMINER**